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10/606,898	06/27/2003	Hojjat Fathollahi		6151

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EXAMINER

TRIEU, THAI BA

ART UNIT PAPER NUMBER

3748

DATE MAILED: 05/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/606,898	FATHOLLAHI, HOJJAT	
	<b>Examiner</b>	<b>Art Unit</b>	
	Thai-Ba Trieu	3748	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input checked="" type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____.  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____.   | 6) <input type="checkbox"/> Other: ____.                                    |

### DETAILED ACTION

For the purpose of this Office Action, the claims 1-19 will be examined as best understood by the examiner.

#### *Drawings*

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore the ***“cylinders in conventional engines”*** (See Claim 1, lines 5-6); ***“radiator”*** and ***“water pump”*** (See Claim 3, lines 5-6); ***“oil pump”***, ***“oil cooler”***, ***“holes on the rotor sides”***, and ***“openings at the bottom of the casing on both sides”*** (See Claim 4, lines 4, 6, 25-26, and 28); ***“a plurality of engine blocks”*** (See Claim 12, line 2); and ***“cylinders in conventional compressors”*** (See Claim 17, line 5); and ***“a plurality of compressor blocks”*** (See Claim 19, lines 1-2) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: ***“1003”*** (See Figures 14a, 14b and 14c). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Specification***

#### **1. IN THE ABSTRACT:**

Since the abstract contains 2 paragraphs and 157 words, applicant is required to revise and submit a substitute abstract to meet the requirement set forth below:

Applicant is reminded of the proper language and format for an abstract of the disclosure.

**The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words.** It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

#### **2. IN THE SPECIFICATION:**

1. The disclosure is objected to because of the following informalities:

- On Page 4, Paragraph [0019], line 6, ***"the"*** before ***"said planet gears"*** should be deleted (for avoiding the redundancy).
- On Page 4, Paragraph [0020], lines 2-3, ***"plant"*** before ***"gears"*** should be replaced by -- ***planet*** -- (for correcting typo-error).

Appropriate correction is required.

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

- The recitation of ***"cylinders in conventional engines"*** needs to be incorporated with the specification (See Claim 1, lines 5-6).

- The recitation of ***"in diesel type of this engine"*** needs to be incorporated with the specification (See Claim 2, lines 8-9).

- The recitations of ***"flows into another closed area on the first side"***, ***"the second cover"***, and ***"the first end cover in to a different closed area and finally flows to the last closed area in the first end cover and leaves the engine through an outlet port and heads for the water pump"*** need to be incorporated with the specification (See Claim 3, lines 9-13).

- The recitation of ***"a second duct in one of the end covers"***, ***"a groove on the shaft"***, ***"the other shaft bearing"*** need to be incorporated with the specification (See Claim 4, lines 10, 13-14, 16).

**Note that the circulation of oil claimed in claim 4 needs to be fully disclosed in the specification.**

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- The recitations of ***“the shape of the piston end profile”*** and ***“parameters”*** need to be incorporated with the specification (See Claim 5, lines 1-2).
  
- The recitation that ***“the hinged connection of the planet gears and the piston rod should not cross the imaginary line connecting..... at combustion stroke”*** needs to be incorporated with the specification (See Claim 6, lines 2-5).
  
- The recitation of ***“the lever is pulled and rotated...; at the time of locking, the tongue will go through a hole in the rotor”*** needs to be incorporated with the specification (See Claim 7, lines 4-8).
  
- The recitation of ***“the ends of the seals being shaped so that they cover each other in this area and provide an air-tight sealing”*** needs to be incorporated with the specification (See Claim 8, lines 3-4).
  
- The recitation that ***“the air fuel intake stroke cannot overlap at any time unless it is part of the design requirements”*** needs to be incorporated with the specification (See Claim 10, lines 1-3).
  
- The recitation of ***“the piston rod being under tension in combustion, exhaust and compression strokes and being under compression only in the***

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**intake stroke**" needs to be incorporated with the specification (See Claim 11, lines 1-3).

- The recitation of **"the engine comprising a plurality of engine blocks"** needs to be incorporated with the specification (See Claim 12, lines 1-2).

- The recitation that "the value of  $n$  is unique for the engine block" needs to be incorporated with the specification (See Claim 14, lines 5).

- The recitation of **"the number of pistons in each engine block being equal  $4*n$ "** needs to be incorporated with the specification (See Claim 15, lines 1-2).

- The recitation of **"the gear teeth ratio of the sun gear to the planet gear being expressed as  $2*n$ "** needs to be incorporated with the specification (See Claim 16, lines 1-2).

- The recitation of **"replacing cylinders in conventional compressors"** needs to be incorporated with the specification (See Claim 17, line 5).

- The recitation of **"a plurality of compressor blocks"** needs to be incorporated with the specification (See Claim 19, lines 1-2).

### ***Claim Objections***

Claims 1-19 are objected to because of the following informalities:

1. Claim 1 should be replaced by following:

-- An internal combustion rotary engine comprising:

a casing forming a cylindrical chamber and having a [[number]] **plurality** of holes and ducts as part of [[the]] cooling[[-]] and the lubrication systems[.];

end covers that support [[the]] **a** main engine shaft and are securely fixed on [[the]] sides of the casing[.];

a rotor as a means for delivering power including piston chambers [[(replacing cylinders in conventional engines)]], rotationally reciprocating pistons in **the** piston chambers to convert [[the]] expansion of combustion gas to rotational motion[.];

piston pins allowing pistons to rotate around the pin axes[.];

planet gears mounted on one or both side(s) of the rotor by fixing supports and piston rods that synchronize the rotation of both the pistons and [[the]] said planet gears where the planet gears are meshed with a sun gear(s) fixed on one or both side(s) of the casing on [[the]] **an** engine block; and

the rotation of the planet gears around their own axes at the combustion stroke causes them to move on the sun gear(s) and causes



[[the]] said rotor to rotate around [[the]] a main shaft axis *(for avoiding double recitation, redundancy, and lack of antecedent basis in the claims).*

2. Claim 2 should be replaced by following:

-- [[An]] The internal combustion rotary engine as defined in claim 1,  
[[wherein there is(are) a]] further comprising:

at least one of circular [[seal(s)]] seals at each side of [[the]] an  
outer surface of the rotor; [[and there is(are) a]]

at least one of straight transverse [[seal(s)]] seals close to the  
edge of the piston chambers on the outer surface of the rotors preventing  
gas leakage [[, also there are]] ;

four seals on each piston ( one seal on each contacting side of the  
piston ) for gas sealing;

ports on the casing for [[each]] said engine block as air-fuel mixture  
intake port(s) and exhaust gas outlet port(s); park plug(s) [[is(are)]] located  
on the casing and [[will]] initiate the ignition of compressed air-fuel  
mixture[[. In]]; and

in a diesel type of this engine, fuel injectors(s) [[replaces]]  
replacing the spark plug(s) *(for avoiding lack antecedent basis in claims,  
and claim is required to write in a single sentence with many indents, See  
37 CFR 1.75 and MPEP § 608.01(i)-(p)).*

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3. Claim 3 should be replaced by following:

-- [[An]] The internal combustion rotary engine as defined in claim 1, wherein the cooling system of the engine comprises:

two end covers for [[each]] said engine block, mounted on the sides of the casing, their end plates and longitudinal holes passing through the casing;

the lubrication system also acts as a cooling system [[and is introduced in claim no. 4 ]];

the cooling water from [[the]] a radiator or [[the]] a water pump enters [[the]] a water inlet port on one of the end plates, then enters a closed area formed by the end plate and [[the]] end cover inner walls and flows to the closed area at the other side of the casing by passing through [[the]] said longitudinal holes in the casing, and then flows into another closed area on the first side;

water flows several times to [[the]] a second end cover ([[in to]] into a different closed area) and back again to [[the]] a first end cover ([[in to]] into a different closed area) and finally flows to the last closed area in the first end cover and leaves the engine through an outlet port and heads for the water pump *(for avoiding double recitation, lack of antecedent basis in claims, and correcting typo error).*

4. Claim 4 should be replaced by following:

-- [[An]] The internal combustion rotary engine as defined in claim 1,  
wherein the lubrication system comprises:

an oil-tank as the oil reservoir,

a strainer,

a duct at the bottom of the casing in order for oil to flow from the  
strainer to the outlet for the oil pump,

an inlet port on one of the end covers with its related duct on the  
casing in order for the excess oil to return to the oil tank,

an inlet port on the end cover to receive oil from [[the]] an oil pump  
or [[the]] an oil cooler in order for oil to flow to the oil filter seated on the  
casing;

the oil [[comes out through the]] coming out off an oil filter [[, ]]  
and entering a duct in the casing at the top which has many small holes  
through the inner surface of the casing for the lubrication of the gears; and

the remaining oil in the duct [[enters]] entering a second duct in  
one of the end covers, [[this oil goes for the lubrication of]] and  
lubricating the rotor, the shaft bearing and the inner surface of the casing  
[[where it is in touch with the rotor]];

the oil [[reaches]] reaching the rotor shaft at [[the]] a bearing  
through the second duct and [[enters]] entering the hole in the shaft;  
[[also there is a groove on the shaft at each bearing position for

lubrication]] wherein the oil lubricates each bearing in a groove on the shaft.

the oil in the shaft hole [[flows]] flowing through several smaller radially located holes [[and goes for]] to the piston chambers and the other shaft bearing;

the oil in those holes provided for the lubrication of the piston chambers [[passes]] passing through components called "oil bridge" that includes two small outlet ports,

one nozzle-shaped hole [[in order for]] wherein the oil [[to enter]] enters the piston chamber area to lubricate the chamber and the piston;

the remaining oil [[flows]] flowing through the second hole to [[a]] the duct in the rotor[, which goes for the lubrication of]] for lubricating the cylindrical area of the piston and its corresponding surface of the chamber;

then the oil [[leaves]] leaving the rotor through a small hole to lubricate the outer surface of the rotor and the inner surface of the casing;

[[using]] an oil flow limiter [[through which]] wherein the oil passes in a controlled manner and from whose sides the excess oil can come out;

[[also there are]] a plurality of holes on rotor sides to lead oil out of the chamber after lubricating the chamber and the pistons[[. After]]; and

[[after lubrication,]] the oil in the casing [[flows]] flowing to the oil tank via openings at the bottom of the casing on both sides (*for avoiding*

*lack antecedent basis in claims, and claim is required to write in a single sentence with many indents, See 37 CFR 1.75 and MPEP § 608.01(i)-(p)).*

5. **For Claims 5-19**, based on the format and the sample of correcting claims 1-4 above, applicant is required not only to review and to correct the minor informalities in these claims.

6. In claim 7, lines 2, and 7, ***“will prevent”*** and ***“will go”*** should be replaced by **-- prevents --** and **-- goes--**.

6. In claim 14, line 2, ***“one working stoke”*** should be replaced by **-- one working cycle--**.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Specifically, cylinders in conventional engines/compressors claimed in Claim

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1, lines 5-6; and claim 17, line 5; and the circulation of the cooling and lubrication system, claimed in claims 3 and 4, are not disclosed in the specification.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 1-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically,

1. In claims 1 and 17, the recitation of ***"replacing cylinders in conventional engines/compressors"*** renders the claim indefinite, since it is not clear that which kind of engine/compressor having cylinders, applicant wants to reference to and to replace piston chambers.

2. In claim 4, the recitation that ***"oil passes in a controlled manner"*** renders the claim indefinite, since it is not clear that which the controlled manner is to be referenced to. Applicant should define the controlled manner of the oil as passing through the limiter.

Additionally, "the recitation that ***"from whose sides the excess oil can come out"*** renders the claim indefinite, since it is not clear that under which condition the excess oil comes out from which sides (i.e. front side, or back side, or lateral side, or first side, or second side, or this side, or other side); and under which condition the

excess oil cannot come out. Therefore, applicant should clarify the condition for the excess oil comes out from the defined sides.

3. In claim 5, the recitation of **"could be adjusted"** renders the claim indefinite, since it is not clear that under which condition the shape of the piston end profile is/was adjusted, and under which condition this shape is/was not adjusted. Therefore, applicant should define the condition for the shape of the piston end profile being adjusted, and clarify the claimed limitations.

Additionally, the recitation of **"these parameters"** renders the claims indefinite, since it is not clear that which parameter(s) applicant wants to reference to, such as rotational speed, or amount of air, or amount of fuel, or amount of air-fuel mixture, etc... Applicant should define this limitation.

3. In claim 6, the recitation of **"the rotor can rotate in just one direction"** renders the claim indefinite, since it is not clear that under which condition the rotor can rotate in just one direction, and under which condition the rotor cannot rotate in just one direction. Therefore, applicant should define the condition for the shape of the piston end profile being adjusted to achieve a desired compression ratio, and clarify the claimed limitations.

4. In claim 8, the recitation of **"the ends of the seals being shaped so that they cover each other in his area and provide an air tight sealing"** renders the

claim indefinite, since it is not clear how the ends of the seals are to be shaped and how the ends of the seals cover each other to provide air tight sealing. Applicant should incorporate this recitation with the specification of the instant application, and also explain and clarify the shape of the ends of the seals providing an airtight sealing.

5. In claim 10, the recitation that ***"the air-fuel intake stroke and the exhaust stroke cannot overlap at any time unless it is part of the design requirements"*** renders the claim indefinite, since it is not clear that under which condition and when the air-fuel intake stroke and the exhaust stroke overlap, and under which condition and when the air-fuel intake stroke and the exhaust stroke cannot overlap. Therefore, applicant should define the condition and the time for the intake stroke and the exhaust stroke working, and clarify the claimed limitations.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

***Claims 1, 5-6, 10, 11, 13-17, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dobrovolny (Patent Number CA 1 155 064 A), in view of Sanchez Talero et al. (Patent Number 6,668,767 B1).***



Dobrovolny discloses an internal combustion rotary engine/compressor comprising:

a casing (20) (See Figure 6) forming a cylindrical chamber and having a number of holes (71) (See Figure 1) and ducts (304) (See Figure 3) as part of the cooling system (See Page 15, lines 18-21);

end covers (21,22) that support the main engine shaft (26) and are securely fixed on the sides of the casing (20) (See Figure 6);

a rotor as a means for delivering power including piston chambers (35), rotationally reciprocating pistons (44) in piston chambers to convert the expansion of combustion gas to rotational motion, piston pins (47) allowing pistons to rotate around the pin axes (See Figures 1-5 and 7);

planet gears (56) mounted on one or both side(s) of the rotor by fixing supports and piston rods (59) that synchronize the rotation of both the pistons (44) and the said planet gears (56) where the planet gears are meshed with a sun gear(s) (27) fixed on one or both side(s) of the casing (20) on the engine block and the rotation of the planet gears (56) around their own axes at the combustion stroke causes them to move on the sun gear(s) (27) and causes the said rotor to rotate around the main shaft axis (26) (See Figures 1-5 and 7);

wherein the shape of the piston end profile is adjusted to achieve a desired compression ratio; parameters and the position

of the spark plug(s) affect the performance of the mixture combustion ;

wherein the rotor can rotate in just one direction; to identify the direction of rotation, the hinged connection of a planet gear and piston rod should not cross the imaginary line connecting the center of the planet gear and the center of the sun gear at combustion stroke (See Figures 1-5 and 7, Abstract, Page 15, lines 23-24, Page 16, lines 1-26, Page 16A, lines 1-20);

wherein an air fuel intake stroke and an exhaust stroke cannot overlap at any time unless it is a part of the design requirements (See Page 16, line 9-26, and Page 16A, lines 1-21);

where each engine block consisting of a rotor and its related casing (20) and end covers (21, 22) (See Figure 6); and

wherein the number of pistons (44) in each engine block (20) is equal to  $4*n$  (in the Dobrovolny patent there are one engine block and four pistons) (See Figures 1-5).

However, Dobrovolny fails to disclose a lubrication system; the piston rod being under tension in combustion, exhaust and compression strokes and is under compression only in the intake stroke; and one working cycle comprising intake, compression, combustion and exhaust, per one revolution of the main shaft.

Sanchez Talero teaches that it is conventional in the rotary internal combustion engine art, to utilize a lubrication system (302, 404) (See Figure 5, Column 1, lines 54-

58, Column 2, lines 65-67, and Column 3, lines 1-19); the piston rod being under tension in combustion, exhaust and compression strokes and is under compression only in the intake stroke (See Figures 1-5); and the number of complete working strokes (one working stroke comprises intake stroke, compression stroke, combustion stroke and exhaust stroke) per revolution of the main shaft for each piston is  $n$  where  $n$  can be 1,2,3,... and the value of  $n$  is unique for an engine block (See Figures 1 and 4; Column 1, lines 31-53).

It would have been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized a lubrication system, the piston rod being under tension in combustion, exhaust and compression strokes and is under compression only in the intake stroke; and one working cycle comprising intake, compression, combustion and exhaust, per one revolution of the main shaft, as taught by Sanchez Talero, to lubricate and improve the efficiency of the Dobrovolny device.

***Claims 2, 8-9, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dobrovolny (Patent Number CA 1 155 064 A), in view of Sanchez Talero et al. (Patent Number 6,668,767 B1), and further in view of Lindros (Patent Number 4,072,132)***

The modified Dobrovolny device discloses the invention as recited above, and further discloses four seals on each piston for gas sealing (204, 206, 208, and 210); the gas sealing of the front area piston where two seals meet each other, the ends of the seals being shaped to cover each other on the outer surface of the rotor (See Figure 2,

Column 2, lines 52-65 of Sanchez Talero patent); and ports (104, 110) on the casing for each engine block as air-fuel mixture intake port(s) and exhaust gas outlet port(s); park plug(s) (126) is(are) located on the casing and will initiate the ignition of compressed air-fuel mixture (See Figures 1 and 4 of Sanchez Talero patent).

However, the modified Dobrovolny fails to disclose a circular seal, a straight traverse seal, corner seals, and a diesel engine.

Lindros teaches that it is conventional in the rotary internal combustion engine art, to utilize a circular seal (191) at each side of the outer surface of the rotor and a straight transverse seal (194) close to the edge of the piston chambers on the outer surface of the rotors preventing gas leakage, corner seals (Not Numbered) being used where the circular seals and the traverse seals meet each other on the outer surface of the rotor (See Figure 6, Column 14, lines 53-68, and Column 15, lines 1-3); and in a diesel engine, fuel injectors being used to replace the spark plugs (See Column 13, lines 20-32).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized a circular seal, a straight traverse seal, and a diesel engine, as taught by Lindros, to prevent unwanted expansion of the combustion products along the rotor sides and the corresponding or associated housing side of the modified Dobrovolny device, which is operated in as a diesel engine as fuel injectors replaces the spark plugs.

***Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dobrovolny (Patent Number CA 1 155 064 A), in view of Sanchez Talero et al. (Patent Number 6,668,767 B1), and further in view of Gardiner (Patent Number 6,539,913 B1).***

The modified Dobrovolny device discloses the invention as recited above, further disclose two end covers (21,22) for the engine block, mounted on the sides of the casing (20) (See Figure 6 of Dobrovolny); and the lubrication system also acts as a cooling system (See Figure 5 of Sanchez Talero); However, fails to disclose longitudinal holes passing through the casing; the cooling water from the radiator or the water pump.

Gardiner teaches that it is conventional in the rotary internal combustion engine art, to utilize longitudinal holes (118) passing through the casing (110); the cooling water from the radiator (119a) or the water pump (119b) entering the water inlet port on one of the end plates, then enters a closed area formed by the end plate and the end cover inner walls and flows to the closed area at the other side of the casing by passing through the said longitudinal holes in casing, and then flows into another closed area on the first side; water flows several times to the second end cover and back again to the first end cover and finally flows to the last closed area in the first end cover and leaves the engine through an outlet port and heads for the water pump (See Figure 1A, Column 7, lines 66-67, and Column 8, lines 1-18).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized longitudinal holes passing through the casing; the

cooling water from the radiator or the water pump, as taught by Gardiner, to improve the efficiency of the modified Dobrovolny device.

***Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dobrovolny (Patent Number CA 1 155 064 A), in view of Sanchez Talero et al. (Patent Number 6,668,767 B1), in view of Zabriskie (Patent Number 1,267,157.***

The modified Dobrovolny device discloses the invention as recited above; however, fails to disclose the engine comprising a plurality of engines blocks.

Zabriskie teaches that it is conventional in the rotary internal combustion engine art, to utilize the engine comprising a plurality of engines blocks (See Figure 1).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized the engine comprising a plurality of engines blocks, as taught by Zabriskie, to improve the performance efficiency of the modified Dobrovolny device.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Kim (US Patent Number 6,722,321 B2) discloses a rotary engine.
- Luzhkov (US Patent Number 6,457,450 B1) discloses a rotary turbine internal combustion engine.

- Edwards (US Patent Number 5,345,905) discloses a method of operating a rotary internal combustion engine.
- Edwards US Patent Number 5,261,365) discloses a rotary internal combustion engine.
- Kurio et al. (US Patent Number 4,729,726) disclose a housing structure for a multiple rotor type rotary piston engine having an oil strainer (35).
- Herpolsheimer (US Patent Number 3,364,908) discloses a rotary cylinder swinging piston engine.
- Quartier (US Patent Number 2,938,505) discloses an annularly spaced oscillating piston engine.
- Wright (US Patent Number 1,790,256) discloses an internal combustion engine.
- Craft (US Patent Number 1,273,743) discloses a rotary engine.
- Wilber, Jr. (US Patent Number 1,349,353) discloses a rotary engine.
- Lassee (Patent Number FR 2 651 828 A) discloses a piston type rotary engine.
- Williams (Patent Number EP 0 103 985 A2) discloses a rotary engine or compressor.
- Tamada (Patent Number JP 56113087 A) discloses a spring pressure contact deformation cam ring type radial pump.
- Scheidecker (Patent number DE 42 25 932 A1) discloses a rotary internal combustion engine having piston mounted shaped combustion elements on an outer rim.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thai-Ba Trieu whose telephone number is (703) 308-6450. The examiner can normally be reached on Monday - Thursday (6:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion can be reached on (703) 308-2623. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TTB  
May 11, 2004



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